

REMARKS

I. Status of the Application

Claims 1-4, 7 and 8 are presently pending in the application. Claims 1-4, 7 and 8 stand rejected under §112, second paragraph as being indefinite. Claims 1-4 and 7 stand rejected either under §102(b) as anticipated by Huang et al. (1997) *Anal. Chem.* 69:4577, or under §103(a) as unpatentable over Huang et al.

Applicants have amended the claims to more clearly define and distinctly characterize Applicants' novel invention. The amendments to the claims can be found in the specification and the claims as originally filed. Specifically, support for the amendment to claim 1 to recite macromolecular array can be found in the specification at least at page 8, lines 16-17, where Applicants teach preparing macromolecular arrays. Support for the amendment to claim 1 to recite attaching a plurality of macromolecules to "a plurality of reactive groups on" the polymeric brush can be found in the specification at least at page 19, lines 5-9, where Applicants teach "polymeric brushes provide a porous three-dimensional matrix functionalized with reactive groups that serve as starting points for macromolecular array synthesis." Applicants respectfully submit that the amendments presented herein do not raise new issues requiring further search, and add no new matter.

II. Claims 1-4, 7 and 8 Are Definite

At page 3, section 5 of the instant Office Action, claims 1-4, 7 and 8 stand rejected under §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Examiner is of the opinion that it appears that the claimed method of preparing a polymeric brush substrate now

contains steps regarding synthesis of macromolecules. The Examiner concludes that this is highly confusing and it is completely unclear as to Applicants' intent. Applicants respectfully traverse this rejection.

Without acquiescing to the rejection, Applicants respectfully submit that claim 1 has been amended to replace the language "polymeric brush substrate for use in solid phase synthesis of macromolecules" with "macromolecular array." Applicants respectfully submit that claim 1 and claims depending therefrom are definite and accordingly request that this rejection be reconsidered and withdrawn.

III. Claims 1-4 and 7 Are Novel and Nonobvious Over Huang et al.

At page 4, section 9 of the instant Office Action, claims 1-4 and 7 stand rejected under §102(b) as being anticipated by Huang et al. (1997) *Anal. Chem.* 69:4577, or under §103(a) as being unpatentable over Huang et al. The Examiner is of the opinion that Huang et al. reads on all of the claimed limitations except for the intended use and thus is deemed to anticipate the instant claims. Applicants respectfully traverse this rejection based on the amended claims now presented.

Applicants' amended claims recite a method of preparing a macromolecular array, the method comprising providing a substrate for solid-phase synthesis of macromolecules to which one or more free radical initiators are covalently attached, wherein each free radical initiator has a radical generation site distal to the substrate, contacting the covalently attached substrate with monomers under conditions that promote free radical polymerization from the radical generation sites of the initiators to form a polymeric brush, and covalently *attaching* a plurality of *macromolecules to a plurality of reactive groups on* the polymeric brush.

The step of covalently attaching a plurality of macromolecules to the polymeric brush provides a much larger number of synthesis sites per unit area of substrate than is offered by the current generation of monofunctional silane-derivatized glass surfaces, while maintaining a similar or greater spacing between sites (page 19, lines 10-15). The extent of binding of “target” molecules to the immobilized macromolecules is substantially increased, which enhances detection, and the multiplicity of binding sites within the polymer support may provide additional kinetic enhancement.

Huang et al. neither teaches nor suggests covalently attaching a plurality of macromolecules to a *plurality of reactive groups on a polymeric brush*, as claimed by Applicants. Although the Examiner asserts, at page 6 of the instant Office Action, that Huang et al. clearly describes the possibility of attaching macromolecules to their polymeric brush to create differing films for new stationary phases, this would not result in attachment to a plurality of reactive groups on a polymeric brush. Huang et al. teaches that “layers of polymer films might be made by simply *changing the monomer* during *polymerization*” (page 4580, right column, emphasis added). Thus, the new monomer would bind the last monomer added to the polymeric chain at a *single reactive group* of the polymeric brush as part of the polymerization reaction. This new monomer would serve as a precursor for generating a new polymeric brush which would be a component of a second polymer film layer. Consequently, this would not result in the new monomer binding to a plurality of reactive sites on the polymeric brush, as claimed by Applicants.

Accordingly, Huang et al. fails to teach or suggest all of Applicants’ claim limitations. Therefore, Applicants respectfully request that the Examiner reconsider and withdraw the rejections of claims 1-4 and 7 under §102(b) or §103(a) over Huang et al.

IV. Conclusion

Having addressed all outstanding issues, Applicants respectfully request reconsideration and allowance of all pending claims. To the extent the Examiner believes that it would facilitate allowance of the case, the Examiner is requested to telephone the undersigned at the number below.

Respectfully submitted,

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John P. Iwanicki, Reg. No. 34,628
BANNER & WITCOFF, LTD.
28 State Street, 28th Floor
Boston, MA 02109
(617) 720-9600